VENUSLAB
OPTOELECTRONICS

Precision Meets Simplicity

Electric Rotating Table

Our series of Precision Electric Rotary Stages is designed to achieve 360° continuous rotation and precise angular positioning. Featuring a high-precision ground worm gear drive mechanism combined with high-resolution stepper motors, these stages ensure smooth motion, high load capacity, and self-locking capability upon power loss. The unique anti-backlash design effectively eliminates gear play, making it the ideal choice for precision optics, laser processing, and automated inspection applications.

Key Features

- **High-Precision Worm Gear Drive**
  High transmission ratio, smooth motion, self-locking capability for enhanced safety.

- **Precision Shafting Design**
  High-precision bearing system ensures minimal runout and wobble, stable rotation center.

- **Anti-Backlash Mechanism**
  Adjustable worm gear meshing eliminates backlash, boosts repeat positioning accuracy.

- **Standard Compatibility**
  Standard stepper motors & DB9 interfaces; central aperture enables wiring/optical path transmission.

Applications

- **Laser Marking & Processing**: Rotating parts for cylindrical marking.
- **Optical Polarization Analysis**: Precise rotation of polarizers or waveplates.
- **3D Scanning & Imaging**: 360-degree object rotation for model reconstruction.
- **Automated Indexing**: Precise angular indexing in assembly lines.

One Platform Many Possibilities

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Part 1: Standard Electric Rotary Stages (VL Series)

Overview:

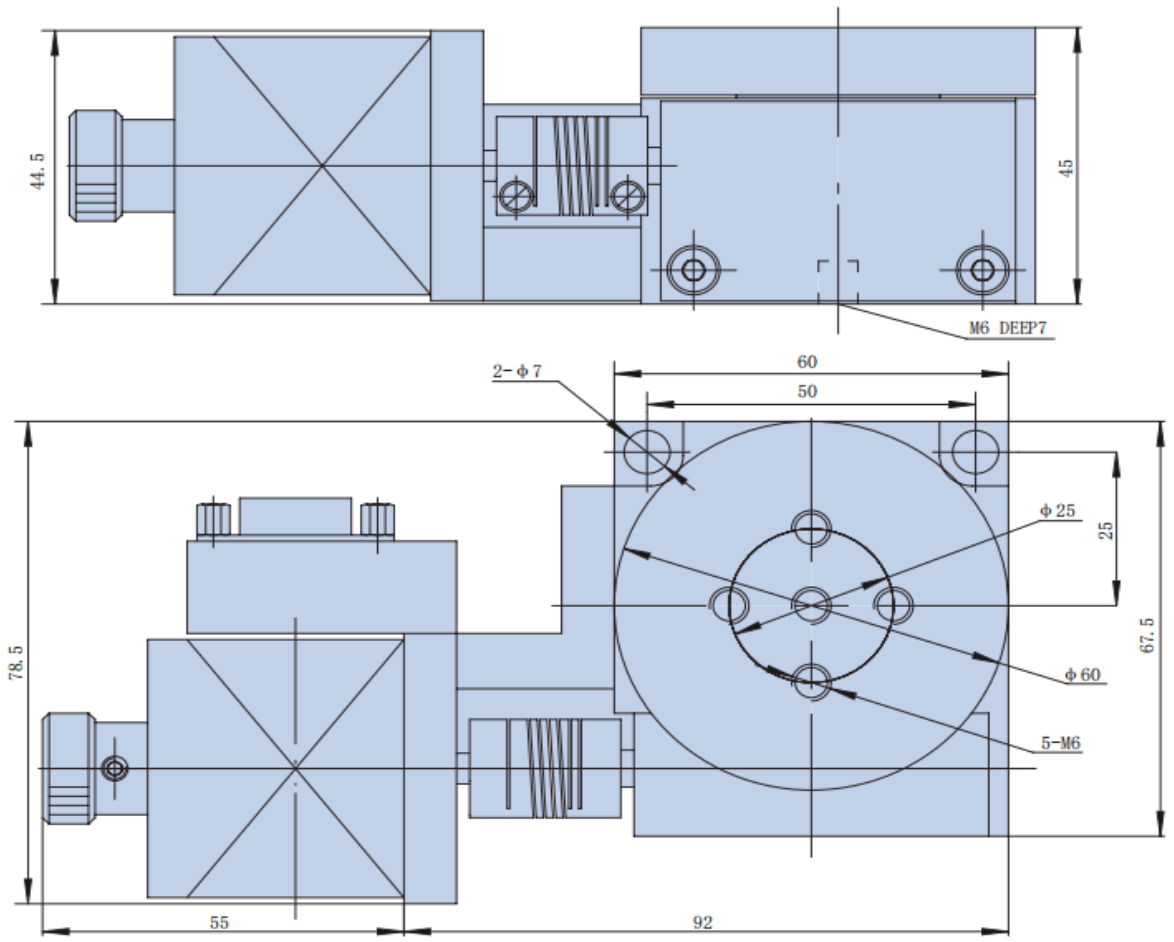
The VL Series utilizes a precision worm gear mechanism to provide smooth, unlimited 360° rotation. Designed for general-purpose industrial and scientific applications, these stages offer a reliable balance of load capacity, torque, and positioning accuracy.

1. VL01RA Series-60M

New Model: VL01RA60M

Model No.	Table Size	Transmission Ratio	Load Capacity	Max Speed	Resolution
VL01RA60M	φ60 mm	90:1	30 kg	50°/sec	0.001° (≈3.6 ″)

Dimensions



Applications

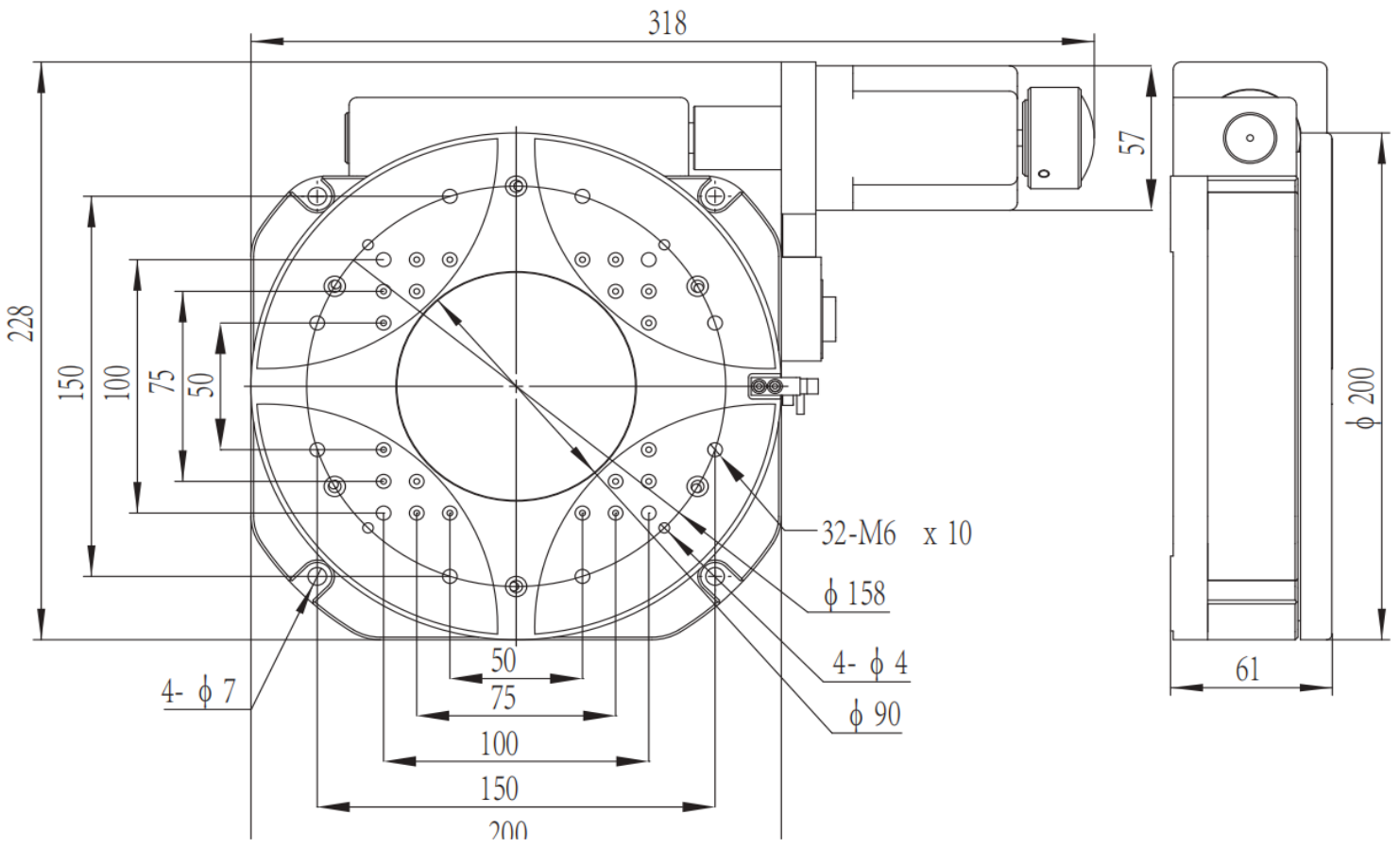
- **Cylindrical Laser Marking:** Rotates small cylindrical parts (like pens or tubes) for seamless laser engraving.
- **Small Component Assembly:** Precision angular positioning for assembling micro-mechanical parts.
- **Optical Sensor Testing:** Rotating sensors to test angular sensitivity and calibration.

2. VL02RA Series-100

New Models: VL02RA100S-90, VL02RA100S-180

Model No.	Table Size	Transmission Ratio	Load Capacity	Max Speed	Resolution
VL02RA100S-90	φ100 mm	90:1	25 kg	45°/sec	0.001° (≈3.6 ″)
VL02RA100S-180	φ100 mm	180:1	45 kg	20°/sec	0.0005° (≈1.8 ″)

Dimensions



Applications

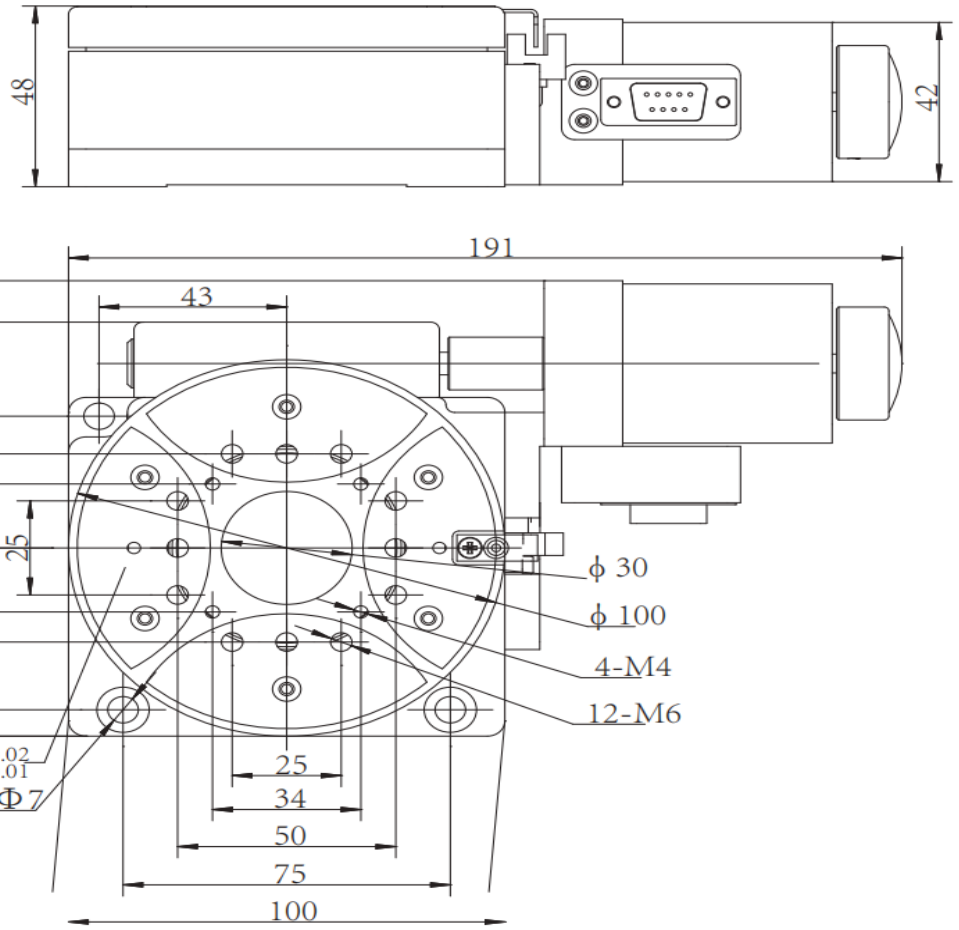
- **3D Scanning Turntables:** Provides smooth, automated rotation for capturing 3D object geometries.
- **Automated Visual Inspection:** Rotates products 360 degrees under a camera to check for defects on all sides.
- **University Laboratory Research:** General-purpose positioning for physics and optical experiments.

3. VL03RA Series-200

New Models: VL03RA200S-90, VL03RA200S-180

Model No.	Table Size	Transmission Ratio	Load Capacity	Max Speed	Resolution
VL03RA200S-90	φ200 mm	90:1	120 kg	45°/sec	0.001° (≈3.6 ″)
VL03RA200S-180	φ200 mm	180:1	250 kg	20°/sec	0.0005° (≈1.8 ″)

Dimensions



Applications

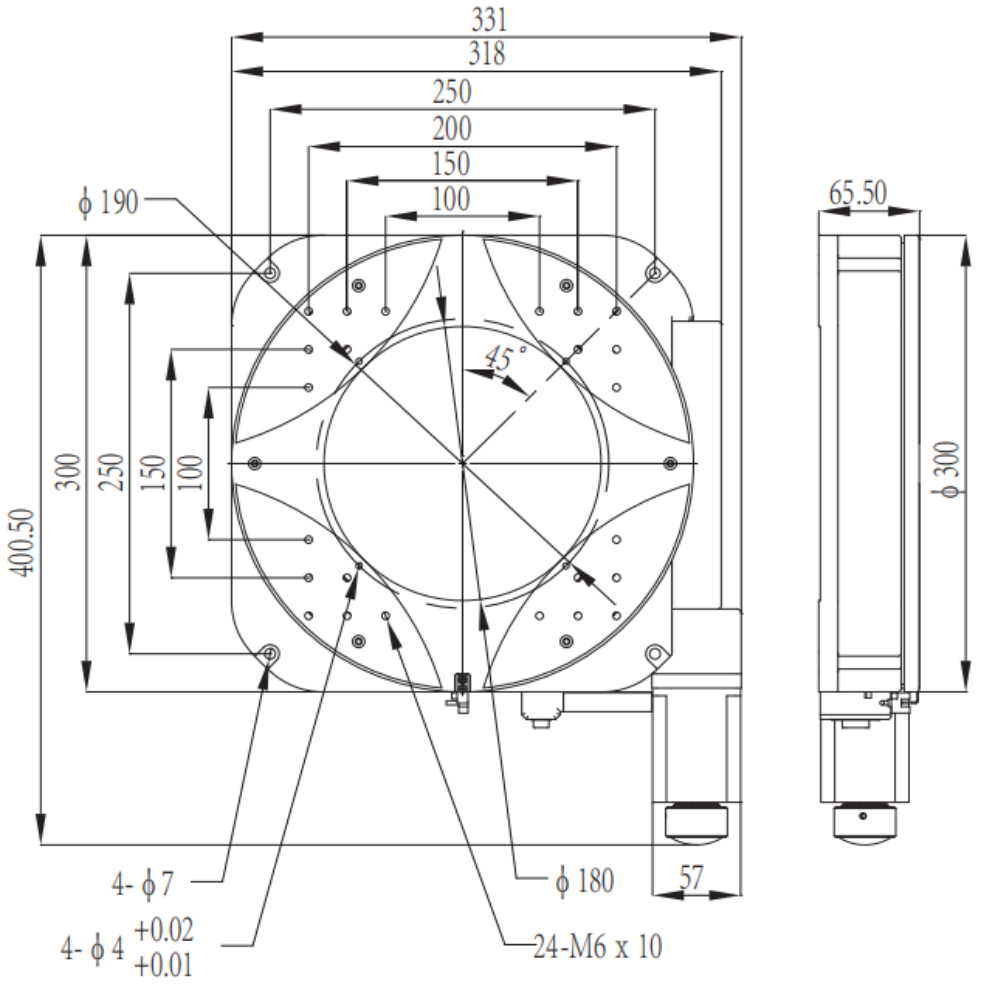
- **Heavy Industrial Indexing:** Accurate indexing for machining or assembly of heavy mechanical components.
- **Antenna Positioning:** Rotating communication antennas or receivers for signal strength testing.
- **Vacuum Chamber Positioning:** (Requires customization) Sample rotation inside vacuum environments for deposition processes.

4. VL04RA Series-300

New Models: VL04RA300S-288, VL04RA300S-576

Model No.	Table Size	Transmission Ratio	Load Capacity	Max Speed	Resolution
VL04RA300S-288	φ300 mm	288:1	25 kg (Dynamic)	45°/sec	0.001° (≈3.6 ″)
VL04RA300S-576	φ300 mm	576:1	45 kg (Dynamic)	20°/sec	0.0005° (≈1.8 ″)

Dimensions



Applications

- **Wafer Handling & Inspection:** Large diameter support for semiconductor wafers during inspection processes.
- **Flat Panel Display Testing:** Rotating large display panels to test viewing angles and color consistency.
- **Large Optical Metrology:** Positioning large mirrors or lenses for interferometric measurements.

Part 2: VenusLab-R Heavy Duty Series

Overview:

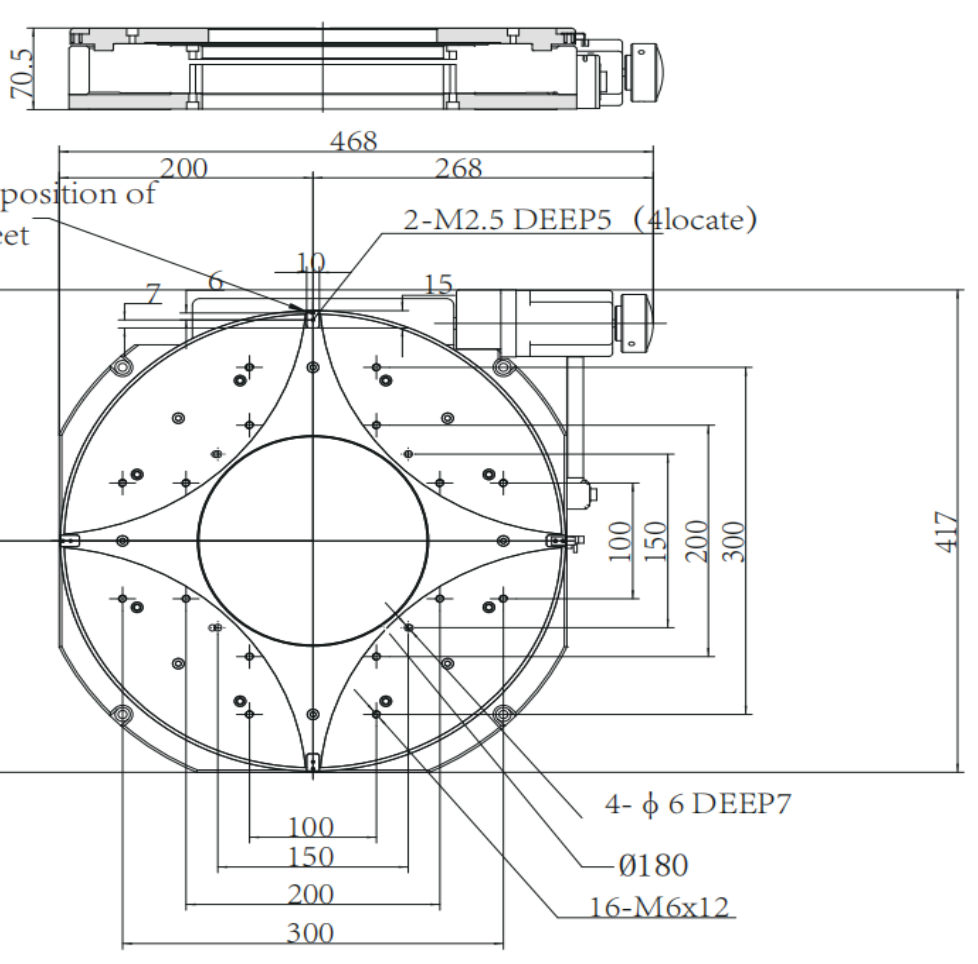
Engineered for maximum load capacity, this series features a large-diameter platform capable of handling industrial loads up to 450kg while maintaining high angular precision.

5. VL05RA400S Series

New Model: VL-R-B400-720

Model No.	Table Size	Transmission Ratio	Load Capacity	Max Speed	Repeatability
VL-R-B400-720	φ400 mm	720:1	450 kg	5°/sec	0.002° (≈7.2 ″)

Dimensions



Applications

- **Aerospace Component Testing:** Rotating heavy aerospace parts for non-destructive testing (NDT) and X-ray inspection.
- **High-Load CNC Machining:** Acting as a 4th axis for heavy-duty drilling or milling operations.
- **Large Telescope Mounts:** Precision azimuth control for optical telescope bases.

Part 3: VenusLab-R Precision Series (Compact & Hollow)

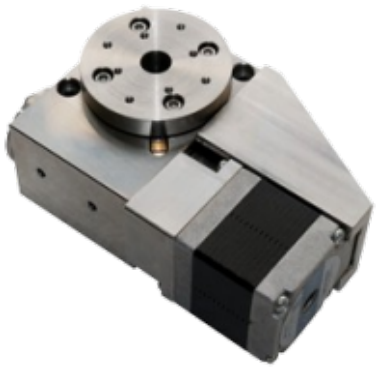
Overview:

This series focuses on high precision and versatility. It includes ultra-compact models for tight spaces and hollow-shaft models that allow for easy cable routing or optical beam transmission.

1. Compact Precision Models

New Models: VL-R-P40H, VL-R-P40P

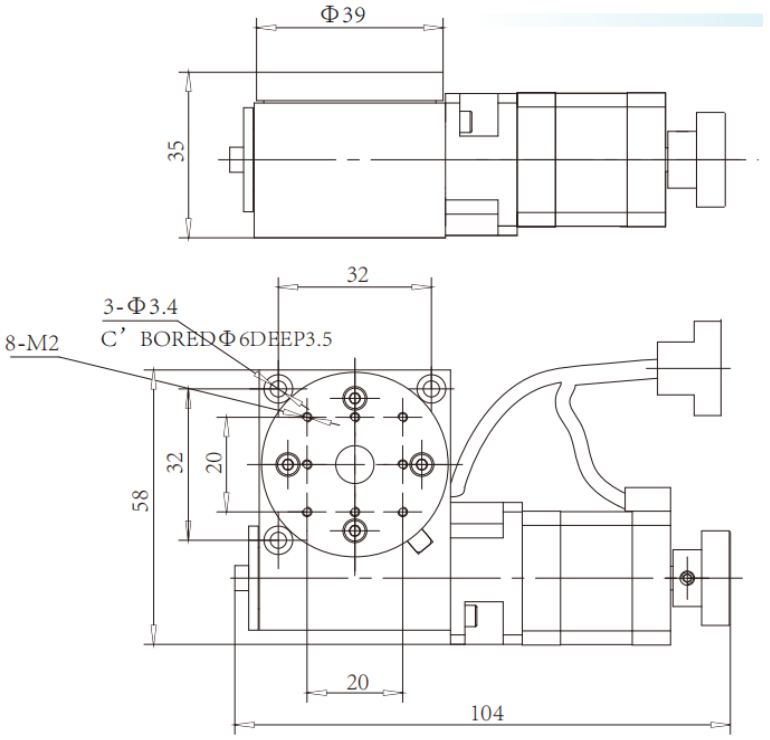
VL-R-P40H



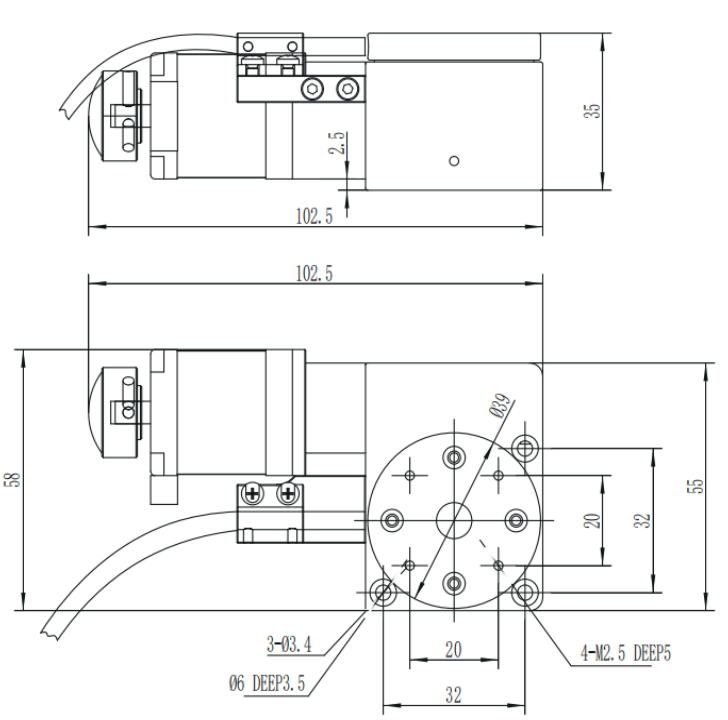
VL-R-P40P

Model No.	Size	Ratio	Load	Material	Feature
VL-R-P40H	φ39 mm	120:1	2 kg	Aluminum Alloy	Lightweight, Cost-effective
VL-R-P40P	φ39 mm	120:1	2 kg	Stainless Steel	Corrosion Resistant, High Stability

Dimensions



VL-R-P40H



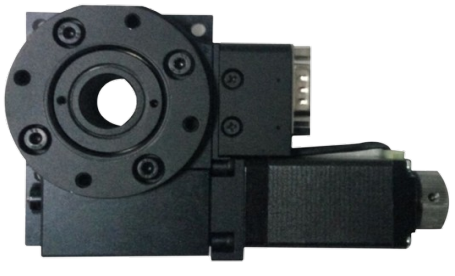
VL-R-P40P

Applications

- **Micromanipulation:** Precise rotation of biological samples or micro-needles under microscopes.
- **Vacuum & Cleanroom Environments:** The stainless steel version (P40P) is ideal for environments requiring low outgassing and corrosion resistance.
- **Fiber Alignment:** Fine angular adjustment of fiber optic components in compact packages.

2. Hollow Shaft & Thin Models

New Models: VL-R-P60H, VL-R-P200H

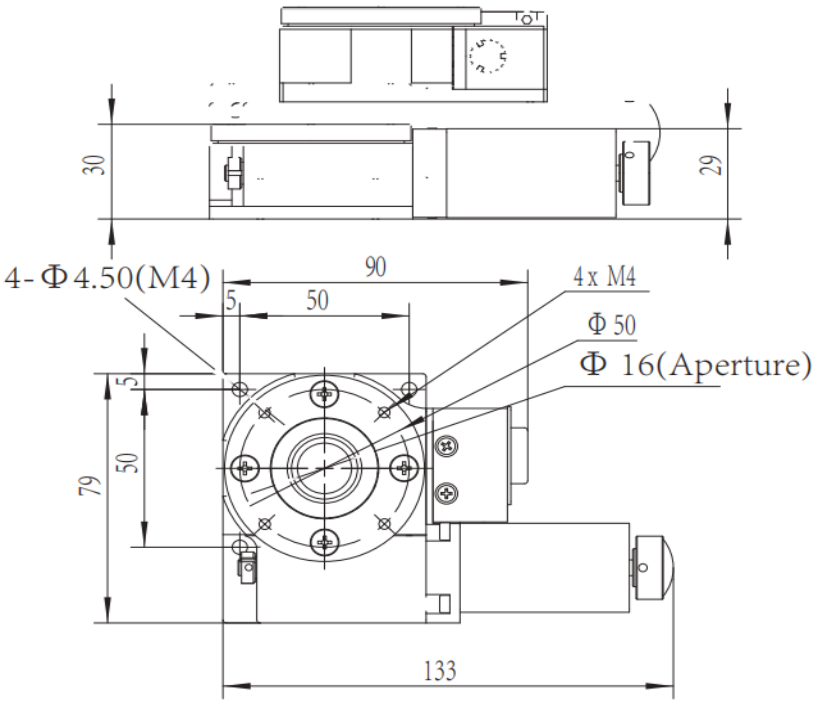


VL-R-P60H

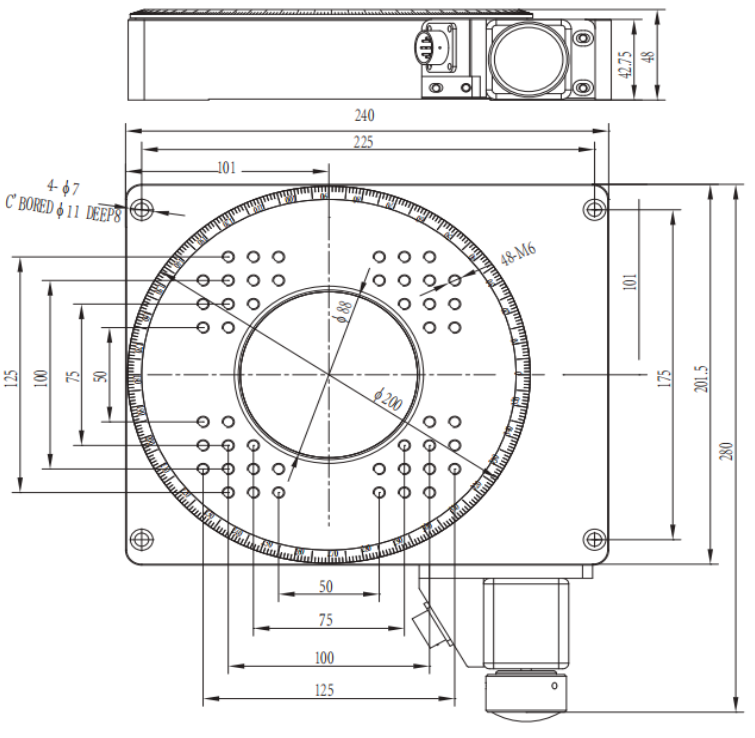
VL-R-P200H

Model No.	Size	Ratio	Center Load	Feature
VL-R-P60H	φ60 mm	110:1	5 kg	Cross-Roller Bearing Guide
VL-R-P200H	φ200 mm	180:1	100 kg	Large Hollow Aperture

Dimensions



VL-R-P60H



VL-R-P200H

Applications

- **Through-Hole Wiring:** The hollow center allows electrical cables or pneumatic tubes to pass through, perfect for slip-ring integration.
- **Beam Steering:** Laser beams can pass through the center of the stage for optical modulation experiments.
- **Polarization Analysis:** Rotating polarizers or waveplates with high precision cross-roller stability.

Part 4: VenusLab-R High Speed Series

Overview:

Unlike standard worm-gear stages, these models utilize synchronous belt drives or specialized gearing to achieve high rotational speeds, making them ideal for rapid scanning and manufacturing processes.

1. VenusLab-R-Base (High Speed 60)

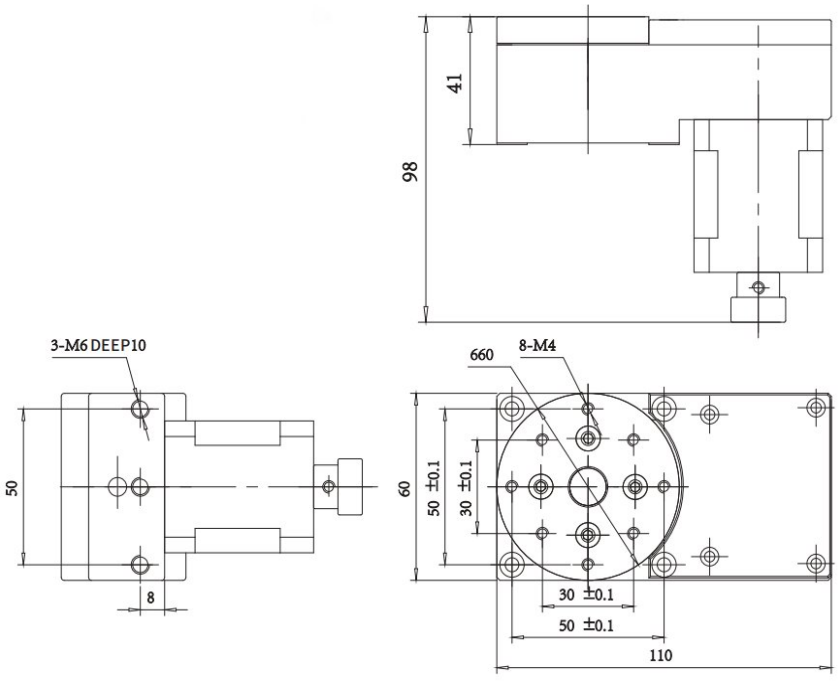
New Models: VL-R-N60, VL-R-N60Pro

VL-R-N60

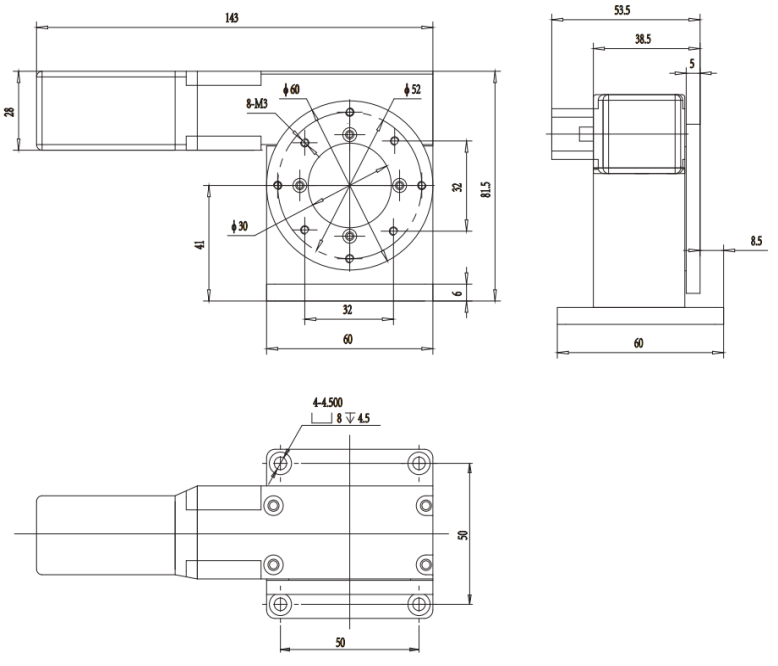
VL-R-N60Pro

Model No.	Size	Ratio	Max Speed	Drive Mechanism
VL-R-N60	φ60 mm	1:2	720°/sec	Synchronous Belt
VL-R-N60Pro	φ60 mm	90:1	25°/sec	Precision Worm Gear

Dimensions



VL-R-N60



VL-R-N60Pro

Applications

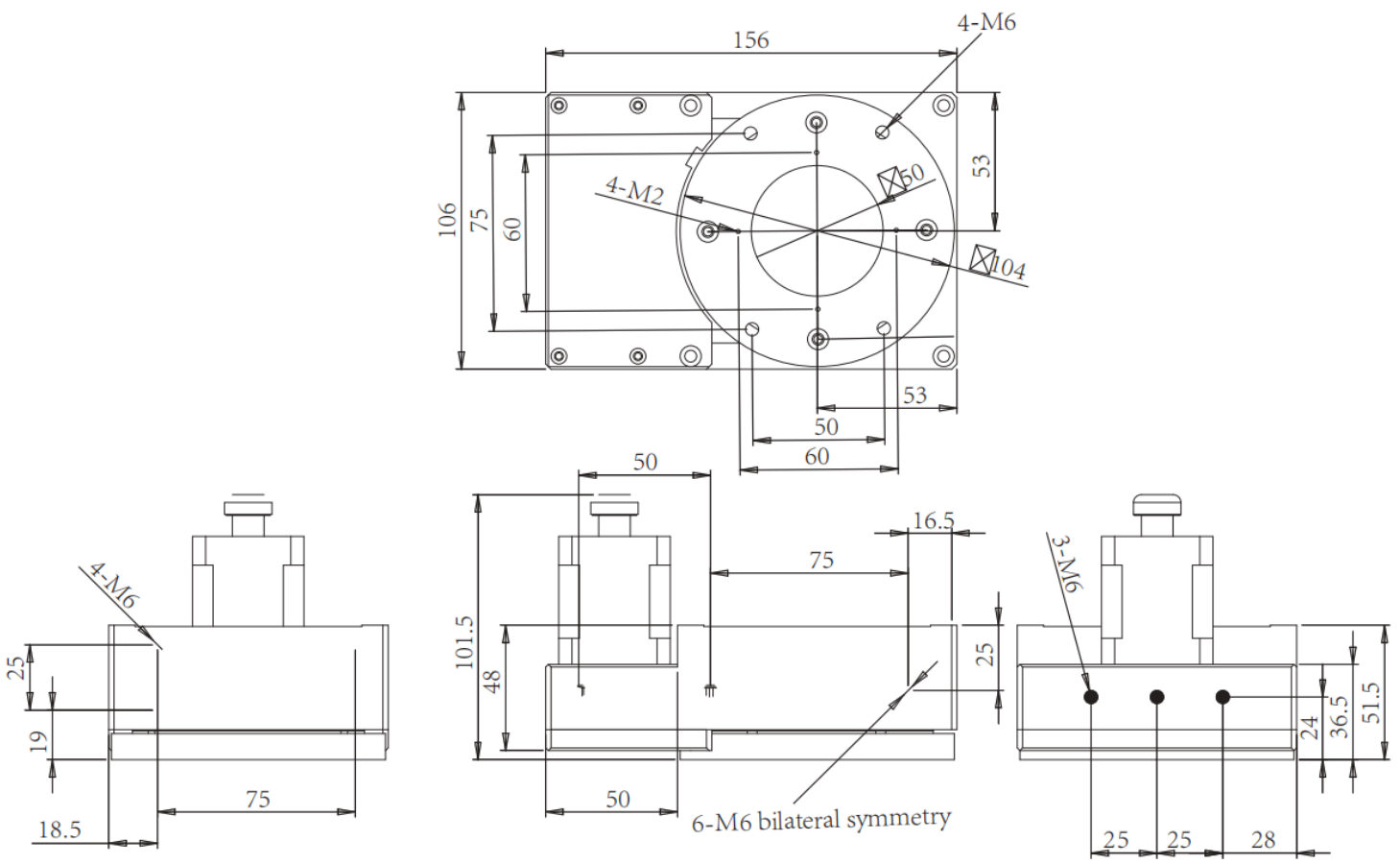
- **High-Speed Lidar Scanning:** Rapid rotation of sensors for environmental mapping and Lidar applications.
- **Optical Choppers:** Used as a variable speed optical chopper in photonic experiments.
- **Rapid Coating Processes:** Spinning substrates quickly for even coating distribution (spin coating).

2. VenusLab-R-N100 (High Speed 100)

New Model: VL-R-N100

Model No.	Size	Ratio	Max Speed	Drive Mechanism
VL-R-N100	φ100 mm	1:3	360°/sec	Synchronous Belt

Dimensions



Applications

- **Industrial Automation Sorting:** Fast orientation of parts on conveyor systems for packaging or sorting.
- **Dynamic Imaging:** Capturing high-speed events from multiple angles in rapid succession.
- **Laser Drilling:** Rapid positioning of workpieces for multi-angle laser percussion drilling.

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